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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/550.598	04/17/00	OHTANI H	0756-2119

MM92/1011

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EXAMINER	
CAO.P	
ART UNIT	PAPER NUMBER
2814	

DATE MAILED: 10/11/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
09/550,598	Ohtani et al.
Examiner	**Art Unit**
Phat X. Cao	2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Apr 17, 2000*.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-26* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). *3-8*

18) ☐ Interview Summary (PTO-413) Paper No(s). _____

19) ☐ Notice of Informal Patent Application (PTO-152)

20) ☐ Other:

DETAILED ACTION

Claim Objections

1. Claim 19 is objected to because of the following informalities: in claim 19, a word "Midium" should be changed to "indium". Appropriate correction is required.

2. Claim 13 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

In claim 13, the preamble "A semiconductor device" is improper in a dependent process claim..

Claim Rejections - 35 USC § 112

3. Claims 20-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 20-26 are unclear because they are dependent claims which refers to more than one claims in the conjunctive ("14" and "15") rather than in the alternative ("14" or "15"). This form is improper under 35 U.S.C. 112 and 37 CFR 1.75 (c). (See MPEP 608.01 (n)).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

5. Claims 1 and 3 are rejected under 35 U.S.C. 102(e) as being anticipated by Jun (US. 5,948,705).

With respect to claim 1, Jun, in Figs. 3A - 3E, discloses a method for producing a semiconductor device comprising: a step of forming a first conductive layer 33; a step of forming an insulating layer 34 over the first conductive layer; a step of forming an opening 35 in the insulating layer 34 to expose the first conductive layer 33 at a bottom of the opening; a step of forming an embedded conductive layer 36 to cover the insulating layer and the opening; a step of etching the embedded conductive layer 36 to make a sate in that only the opening is filled with the embedded conductive layer 36; and a step of forming a second conductive layer 38 on the insulating layer and the embedded conductive layer.

With respect to claim 3, Jun further discloses in Figs. 4A - 4E anther method for producing a semiconductor device comprising all the steps recited in the claimed invention, including a step of etching the embedded conductive layer 46' by using the second conductive layer 48 as a mask in a self-alignment manner (see Figs. 4D - 4E and column 7, lines 25-30).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 2, 4-6, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jun in view of Kobayashi et al (US. 6,221,140).

As discussed in details above, Jun substantially reads on the above claims, except it does not disclose the conductive layer 46 is made of an oxide conductive layer and is formed by a spin coating method.

However, Kobayashi et al teach in column 2, lines 34-48 the obviousness of forming an oxide conductive layer by a spin coating method to cover the substrate and the opening. Accordingly, it would have been obvious to form the conductive layer 46 of Jun with the material and the method as set forth above, because according to Jun a method of spin coating of an oxide conductive layer on a substrate is known for reducing in manufacturing cost (see column 2, lines 24-33).

8. Claims 7-12 and 19-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jun and Kobayashi et al as applied to claim (2,5,6,13) above, and further in view of Fukunaga et al (US. 5,706,064).

With respect to claims 7-12, neither Jun nor Kobayashi et al discloses the embedded conductive layer made of materials as claimed.

However, Fukunaga et al teach in Fig. 17 the obviousness of forming an embedded conductive layer 411b made of inorganic oxide conductive layer of ITO or ZnO (column 5, lines 66-67 through column 6, lines 1-3), or made of organic conductive layer of carbon (column 20, lines 36-37), or polymer (column 26, lines 54-61). Accordingly, it would have been obvious to form the embedded conductive layer of the above combination with the materials as set forth above, because according to Fukunaga et al, these materials would provide a low price and a high speed response mode for LCD (column 1, lines 55-59).

With respect to claims 19-26, Fukunaga et al further teach in column 1, lines 5-30 that because the liquid crystal display device has high image quality and can be used as switching elements, this kind of display device has been widely used as a display device in a personal computer, television or the like.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jun (US. 5,948,705) in view of Jun (US. 6,043,149).

Jun ('705) does not disclose the embedded conductive layer is polished by chemical mechanical polishing.

However, in view of Jun ('149), it would have been obvious to polish the embedded conductive layer by chemical mechanical polishing, because CMP process would prevent a recess from occurring in the embedded conductive layer (see Fig. 3C and column 5, lines 18-21).

10. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jun ('705) and Jun ('149) as applied to claim 14 above, and further in view of Fukunaga et al (US. 5,706,064).

Neither Jun ('705) nor Jun ('149) discloses the embedded conductive layer made of materials as claimed.

However, Fukunaga et al teach in Fig. 17 the obviousness of forming an embedded conductive layer 411b made of inorganic oxide conductive layer of ITO or ZnO (column 5, lines 66-67 through column 6, lines 1-3), or made of organic conductive layer of carbon (column 20, lines 36-37), or polymer (column 26, lines 54-61). Accordingly, it would have been obvious to form the embedded conductive layer of the above combination with the materials as set forth above, because according to Fukunaga et al, these materials would provide a low price and a high speed response mode for LCD (column 1, lines 55-59).

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jun (US. 5,948,705) in view of Fukunaga et al and Jun (US. 6,043,149).

As discussed in details above, the combination of Jun ('705) and Fukunaga et al substantially reads on the claimed invention, except it does not disclose the embedded conductive layer is polished by chemical mechanical polishing.

However, in view of Jun ('149), it would have been obvious to polish the embedded conductive layer by chemical mechanical polishing, because CMP process would prevent a recess from occurring in the embedded conductive layer (see Fig. 3C and column 5, lines 18-21).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phat X. Cao whose telephone number is (703) 308-4917. The Examiner can normally be reached on Monday through Thursday. If attempts to reach the Examiner by telephone are unsuccessfully, the Examiner's supervisor, Olik Chaudhuri, can be reached on (703) 306-2794.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. Group 2800 fax number is (703) 308-7722 or (703) 308-7724.

PC
October 8, 2001

Cao, Phat X.
Patent Examiner
Technology Center 2800